

**Effects of density stratification on
the thermal convection in rotating spherical shell**

K. Kusano et al.

Hiroshima Univ., Japan

We develop a new numerical model of compressible convection using pseudo-spectral method, and investigate how the thermal convection in rotating spherical shell is affected by the change in density stratification. Numerical simulations are performed using three different density stratified equilibria, those are constructed by changing polytropic index. The density ratio between the bottom and the top of these equilibria is in the range of 2 to 10, and the Taylor number is fixed to 10^4 . It is found that, when the Rayleigh number is slightly above the instability threshold, the convection structure is little changed by the difference of stratification, whereas, as the Rayleigh number is increased, the convection with strong stratification is subject to a different type of transition of solution from the case of weak stratification. In fact, even sign of the averaged kinetic helicity is changed from negative to positive in northern hemisphere as the density stratification is enhanced. The results indicate that the density stratification is most important element for the solar convection.